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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,044	04/25/2001	Tsuneyuki Hagiwara	206584US2	4351
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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			STOCK JR, GORDON J	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/841,044

Applicant(s)

HAGIWARA ET AL

Examiner

Gordon J. Stock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-24,44-51,53,55 and 57-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-20,22-24,44-51,53 and 57-63 is/are rejected.
- 7) ☒ Claim(s) 21 and 55 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20050131.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. **Claim 55** is objected to for the following: “said mask stage” of line 4 lacks antecedent basis. Correction is required.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. **Claims 1, 2, 4-8, 13-20, 22-23, 59, 60, 61**, are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sogard (5,631,731)—previously cited**.

As for **claims 1, 2, 4, and 7**, Sogard in a method and apparatus for aerial image analyzer teaches the following: illuminating a mark, a test pattern, with an illumination light and forming an aerial image of said mark on an image plane via said projection optical system; arranging a slit-shaped aperture pattern in a first direction within a two-dimensional plane perpendicular to an optical axis of said projection optical system near the image plane of the optical system, the width of said slit-shaped aperture pattern being set in consideration of both the wavelength and the numerical aperture and is under wavelength divided by numerical aperture and multiplied by .8, is suggested by the widths being 50nm, 100nm, and 200nm; scanning pattern forming member in said second direction; photoelectrically converting said illumination light and obtaining a photoelectric conversion signal corresponding to intensity; whereas, a spatial frequency distribution is obtained via Fourier transforming signal; converting said distribution by dividing said distribution with a frequency of said aperture pattern that is already known; and

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inverse Fourier transforming spectral distribution (Figs. 1a, 1b, 2, 3a, 3b; col. 4, lines 30-45; col. 6, lines 45-65; col. 5, lines 20-25; col. 9, lines 60-67; col. 10, lines 1-50).

As for a width of said at least one slit-shaped aperture being greater than zero, and equal to or under said wavelength of said illumination light divided by said numerical aperture, Sogard does not explicitly state this. However, he states that the maximum spatial frequency possible is the numerical aperture divided wavelength (col. 6, lines 35-50). The period of the pattern would be the inverse of the maximum spatial frequency. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that the width is at least equal to or under said wavelength divided by said numerical aperture, for the pattern period is the inverse of the maximum spatial frequency, numerical aperture divided by wavelength.

As for **claims 5, 6**, Sogard discloses everything as above (see **claim 1**). He is silent concerning the width of the slit pattern having a half a pitch divided by an odd number or width is set as one half of the wavelength divided by numerical aperture. However, he does state that the widths are related to numerical aperture and wavelength and are made to be of adequate resolution to produce the aerial image (col. 9, line 55-67; col. 10, lines 1-50). And states that the maximum spatial frequency possible is the numerical aperture divided wavelength (col. 6, lines 35-50); whereas, the period of the pattern would be the inverse of the maximum spatial frequency. And the slits appear to be a multiple of the wavelength divided by numerical aperture for the slits are 50, 100, 150, 200 nm or range of slit widths (col. 5, lines 20-25; table 1; Fig. 12) and the numerical aperture of the system is .6 and the wavelength used is 248 nm with a coherence factor of .5 (col. 9, lines 55-65). These widths are optimal values. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to have the

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widths be a minimum pitch multiplied by an odd number or be half the wavelength divided by numerical aperture multiplied by an odd number, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)

As for **claims 8 and 23**, Sogard in a method and apparatus for aerial image analyzer teaches the following: illuminating a mark, a test pattern, with an illumination light and forming an aerial image of said mark on an image plane via said projection optical system; arranging a slit-shaped aperture pattern in a first direction within a two-dimensional plane perpendicular to an optical axis of said projection optical system near the image plane of the optical system, the width of said slit-shaped aperture pattern being set in consideration of both the wavelength and the numerical aperture; scanning said pattern forming member; photoelectrically converting said illumination light and obtaining optical properties such as aberrations based on signal (Figs. 1a, 1b, 2, 3a, 3b; col. 4, lines 30-45; col. 6, lines 45-65; col. 5, lines 20-25; col. 9, lines 60-67; col. 10, lines 1-50). As for the slit having dimensions being set in consideration of resolution, Sogard is not explicit but does suggest it for the slit has adequate resolution to reproduce the aerial image (col. 10, lines 40-45). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made the slit dimensions are set in consideration of resolution, for the slits have adequate resolution to reproduce the aerial image which is produced by the projection system and thereby governed by the resolution of the projection system.

As for **claim 13**, Sogard discloses everything as above (see **claim 8**). In addition, a plurality of positions are used to produce aerial images from the plurality of patterns on the test pattern (Fig. 2) and to make certain that the whole image field is characterized suggesting that

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determination of the aberrations are position and light intensity dependent; A distortion may be determined (col. 3, lines 60-65; col. 4, lines 1-5).

As for **claims 14-20, and 22** Sogard discloses everything as above (see **claim 13**). In addition, Sogard shows that the widths of said rectangular marks are wider than widths of slit with line and space patterns in several directions (Figs. 2 and 3a); phase detection is used (Fig. 13; col. 6, lines 25-35); and Figs. 3a-3b show that the intersection of the aerial image with a slice level, an individual slit, is used in the determinations. In addition, said mark is a line and space pattern having periodicity in several directions with two different width marks in the same direction with symmetry (Fig. 2) and coma may be determined (col. 4, lines 1-2). As for an abnormal line width value or asymmetry being used to determine coma, Sogard is silent. However, Figs. 3a-3b are aerial images based on aberration free lenses that show symmetry. It would be obvious to one of ordinary skill in the art at the time the invention was made that the coma would be based on an abnormal line width value or an asymmetry, for a coma free system would have a symmetric normal line width value.

As for **claims 59-61**, Sogard discloses everything as above (see **claim 8**). In addition, Sogard states that optical properties are measured and the projection optical system is adjusted based on image field characterization, for exposure conditions are optimized (col. 3, lines 60-67; col. 4, lines 1-6). Fig. 18a demonstrates transferring said pattern onto a substrate. As for transferal after adjustment, exposure would be performed after optimization (col. 4, lines 1-4).

4. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sogard** (5,631,731)—previously cited in view of **Suwa** (4,650,983).

As for **claim 9**, Sogard discloses everything as above (see **claim 8**). In addition, he discloses line and street with a periodicity in multiple directions (Fig. 2). He is silent concerning detecting a signal a plurality of times while changing a position of said pattern in a direction of said optical axis and using a predetermined evaluation amount that changes in accordance with a position and determines a best focal position based on a largeness of said evaluation amount. However, he discloses that basic lens aberrations may be determined and exposure conditions optimized through use of different line width patterns such as focus (col. 3, lines 65-67; col. 4, lines 1-4). Suwa in a focusing apparatus for projection optical system teaches making measurements of focus at a plurality of vertical positions and using an evaluation amount, contrast, to determine best focal position by maximizing contrast using Fourier transforms (col. 13, lines 20-45; Fig. 11). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to detect a signal a plurality of times from a plurality of vertical positions to determine a maximum contrast in order to determine best focal position, an optimized exposure condition.

5. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sogard (5,631,731)**—previously cited in view of **Suwa (4,650,983)** further in view of **Suzuki (5,631,773)**

As for **claim 10**, Sogard in view of Suwa discloses everything as above. In addition, in view of Suwa evaluation amount is contrast using Fourier transforms and best focal position is where contrast is maximized whereas as the highest frequency component is found (col. 13, lines 20-45; Fig. 11). They are silent concerning evaluation amount being an amplitude ratio of a first order frequency and a zero order frequency component. However, Suzuki in an image projection

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method teaches that contrast is defined by a ratio of intensity between zero order and first order components (col. 6, lines 15-45). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was that the evaluation amount was an amplitude ratio of a first order and zero order component for contrast is a ratio of intensities between zero and first order components.

6. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sogard (5,631,731)**—previously cited in view of **Suwa (4,650,983)** further in view of **Imai et al. (5,502,311)**.

As for **claim 11**, Sogard in view of Suwa discloses everything as above (see **claim 9**). They are silent concerning detecting an image plan shape of said projection optical system by repeatedly performing detection of said best focal position on a plurality of points distanced differently from an optical axis. However, Sogard discloses that basic lens aberrations may be determined and exposure conditions optimized through use of different line width patterns (col. 3, lines 65-67; col. 4, lines 1-4). And Imai discloses repeatedly performing detection of said best focal position at a plurality of points to determine the curvature of the image field. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to repeatedly take measurements at a plurality of positions at the best focal position in order to determine the curvature of the image field and to effect optimization of exposure conditions depending on the determined curvature of the image field.

7. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sogard (5,631,731)**—previously cited in view of **Suwa (4,650,983)** further in view of **Torigoe et al. (5,789,734)**.

As for **claim 12**, Sogard in view of Suwa discloses everything as above (see claim 9). In addition, Sogard discloses different line and space patterns of different pitch and determining spherical aberration (col. 3, lines 65-67; col. 4, lines 1-5). He is silent concerning performing detection of said best focal position repeatedly on a plurality of line and space patterns having different pitch and obtaining spherical aberration based on a difference of best focal position for each line and space pattern. However, Torigoe in an exposure apparatus that compensates for spherical aberration teaches to determine spherical aberration from the difference in best focus positions of two different pitched patterns (col. 8, lines 35-40). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to measure the best focal positions of two different pitched line patterns and find their differences in order to determine the spherical aberration of the exposure system.

8. **Claims 24, 44-50 and 62** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sogard (5,631,731)**—previously cited in view of **Komatsuda et al. (5,594,587)**.

As for **claim 24**, Sogard teaches illuminating a first mark at a first detection point within a field of optical projection system to form an aerial image of said first mark, and measuring light intensity distribution by scanning slit-like pattern with respect to said aerial image of said first mark and converting photoelectrically light; illuminating a second mark at a second point different from the first; whereas, Fig. 2 demonstrates a multiplicity of patterns and a multiplicity of positions to be investigated (Figs. 1a, 1b, 2, 3a, 3b; col. 9, lines 60-67; col. 10, lines 1-50). As for telecentricity, Sogard is silent, but he discloses that basic lens aberrations may be determined and exposure conditions optimized through use of different line width patterns (col. 3, lines 65-67; col. 4, lines 1-4). Komatsuda in an exposure apparatus teaches that an error amount of

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telecentricity is determined to optimize exposure conditions (col. 12, lines 35-50). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that telecentricity would be calculated in order to determine if exposure conditions must be changed in order to optimize exposure.

As for **claims 44-45**, Sogard discloses everything as above (see **claim 24**). In addition, he teaches two marks that are the same (Fig. 2). And the dimensions of the slit pattern are set in consideration of numerical aperture and wavelength (col. 9, lines 55-67; col. 10, lines 1-50).

As for **claim 46**, Sogard discloses the following: an illumination unit (Fig. 1a: 12); a pattern forming member that is set in regards to numerical aperture and wavelength (col. 9, lines 55-67; col. 10, lines 1-50; Fig. 1a: 13; Fig. 3a); a photoelectric conversion element (Figs. 3a and 3b: 45, 46, 48) The system scans the pattern (Figs. 3a and 3b). As for processing unit, he is silent, but Sogard suggests that there is a processing unit, for data is accumulated and displayed (Figs. 5, 7-16). Processing units are well known in the art for processing data. It would be obvious to one skilled in the art that the system had a processing unit, for there is scanning and the data is processed to provide graphical relationships between variables.

As for **claim 47**, Sogard discloses everything as above (see **claim 46**). As for a calculation unit, he is silent. However, he teaches that aberrations may be determined (col. 3, lines 65-67). Therefore, it would be obvious to one skilled in the art at the time the invention was made to have the system comprise a calculation unit in order to calculate aberrations that may be present in the exposure system.

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As for **claim 48**, Sogard discloses everything as above (see **claim 46**). In addition, he discloses a substrate stage and the pattern-forming member is integral with stage (Fig. 1a, 18, 13). And the aerial image analyzer is part of a projection photolithography system (Fig. 1a: 10).

As for **claim 49**, Sogard discloses everything as above (see **claim 46**). As for a control unit, he is silent. However, he teaches that aberrations may be determined (col. 3, lines 65-67). Therefore, it would be obvious to one skilled in the art at the time the invention was made to have the system comprise a control unit in order to calculate aberrations that may be present in the exposure system.

As for **claim 50**, Sogard discloses everything as above (see **claim 46**). As for a mark detection system and control unit, he is silent. Mark detection systems are well known in the art for detecting positions of marks for positional and alignment adjustment in photolithography systems. Therefore, it would be obvious to one skilled in the art to have the exposure apparatus comprise a mark detection system in order to provide positional and alignment detection in the exposure system. As for a control unit, he is silent. However, he teaches that aberrations may be determined (col. 3, lines 65-67) and there is a positional relationship between the marks and the slit pattern, for the test patterns projected have a two dimensional configuration and are at a plurality for projecting in several locations (col. 3, lines 60-65; Fig. 2: 9 sets of patterns comprising at least 8 different patterns). Therefore, it would be obvious to one skilled in the art at the time the invention was made that the system comprises a control unit that determines positional relationships between pattern and the marks, for the image quality of the system may be well characterized over the entire image field and separate determination of a number of lens aberrations may also be determined.

As for **claim 62**, Sogard discloses everything as above (see **claim 48**); whereas, exposure is performed by lithography system (Fig. 1a: 10; Fig. 18).

9. **Claims 51, 53, 57-58, and 63** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sogard (5,631,731)**—previously cited in view of **Taniguchi (JP 11045846)** (citations from translation)—previously cited.

As for **claim 51**, Sogard discloses the following: a self-measurement master, test pattern mask (Fig. 2); an aerial image measurement unit comprising: a pattern forming member; a photoelectric conversion element with driving unit (Figs. 3a and 3b); with a source of illumination for illuminating said pattern to form aerial image and are scanned (Fig. 1a: 12, Figs. 3a). As for a self-measurement master mounting stage that mounts said self-measurement mater, pattern forming test member at position different from a position where a mask on which a pattern is formed is mounted, Sogard is silent. However, he teaches that the reticle is replaced by the test pattern (col. 3, lines 45-50). However, Taniguchi in a scanning type exposure method discloses the following: a reticle with mark and FRM's with a self-measurement master mounting stage, a reticle stage that can move close to a focal position where said illumination light can illuminate; reticle includes at least one of a distortion measurement mark; the marks may be an isolated line mark and line and space mark; wherein exposure is performed (paragraphs 13, 19-21, 25-28, 31). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have a self-measurement master mounting stage for the test pattern and the reticle in order to save time between test measurements and exposure by switching between the test pattern and reticle and to be more economical by having one support for the mask and test pattern rather than two supports for the mask and test pattern individually.

As for **claim 53**, Sogard in view of Taniguchi discloses everything as above (see **claim 51**). In addition, there is a slit-shaped aperture pattern (Figs. 3a) that the width of said slit-shaped aperture pattern being set in consideration of both the wavelength and the numerical aperture and is under wavelength divided by numerical aperture and multiplied by .8, it is suggested by the widths being 50nm, 100nm, and 200nm (col. 9, lines 55-67; col. 10, lines 1-50). As for a width of said at least one slit-shaped aperture being greater than zero, and equal to or under said wavelength of said illumination light divided by said numerical aperture, Sogard does not explicitly state this. However, he states that the maximum spatial frequency possible is the numerical aperture divided wavelength (col. 6, lines 35-50). The period of the pattern would be the inverse of the maximum spatial frequency. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that the width is at least equal to or under said wavelength divided by said numerical aperture, for the pattern period is the inverse of the maximum spatial frequency, numerical aperture divided by wavelength.

As for **claims 57 and 58**, Sogard in view of Taniguchi discloses everything as above (see **claim 51**). In addition, Sogard discloses line and space marks that are isolated from one another (Fig. 2). These marks are for distortion measurements (col. 3, lines 60-67; col. 4, lines 1-6).

As for **claim 63**, Sogard in view of Taniguchi discloses everything as above (see **claim 51**); whereas, exposure is performed by lithography system (Fig. 1a: 10; Fig. 18).

Allowable Subject Matter

10. **Claims 21 and 55** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to **claim 21**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in an optical properties measurement method the particular calculation result being based on a phase difference between a first and second frequency component, in combination with the rest of the limitations of **claim 21**.

As to **claim 55**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in an exposure apparatus the particular control unit, in combination with the rest of the limitations of **claim 55**.

Response to Arguments

11. Applicant's arguments filed January 31, 2005 in regards to **claims 1 and 46** have been fully considered but they are not persuasive. Specifically, that Sogard neither discloses or suggests "a width of said at least one slit-shaped aperture pattern in a second direction perpendicular to said first direction being greater than zero, and equal to or under said wavelength divided by said numerical aperture" is not persuasive because Sogard does not explicitly state this. However, he states that the maximum spatial frequency possible is the numerical aperture divided wavelength (col. 6, lines 35-50). The period of the pattern would be the inverse of the maximum spatial frequency. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that the width is at least equal to or under said wavelength divided by said numerical aperture, for the pattern period is the inverse of the maximum spatial frequency, numerical aperture divided by wavelength.

As for the argument for **claim 8**, a new rejection has been made without the White reference. Please see above. As for the slit having dimensions being set in consideration of resolution, Sogard is not explicit but does suggest it for the slit has adequate resolution to

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reproduce the aerial image (col. 10, lines 40-45). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made the slit dimensions are set in consideration of resolution, for the slits have adequate resolution to reproduce the aerial image which is produced by the projection system and thereby governed by the resolution of the projection system.

The rest of Applicant's arguments with respect to claim rejections have been considered but are moot in view of the new ground(s) of rejection.

As for the allowable subject matter set forth in the previous action in regards to **claims 9-12**, the Examiner apologizes for the inconvenience, but upon further search and consideration new rejections have been made.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. Patent 5,959,721 to Nishi et al. (specifically, Figs. 8a and 8b)

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The

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form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

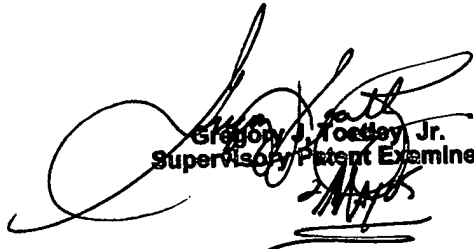
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gs

April 28, 2005

Zandra V. Smith
Primary Examiner
Art Unit 2877


Gregory J. Toatley, Jr.
Supervisory Patent Examiner